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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,204	09/28/2000	Ted Chongpi Lee		8791

46363 7590 03/21/2005

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EXAMINER	
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ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/672,204
Filing Date: September 28, 2000
Appellant(s): LEE ET AL.

Eamon J Wall (registration no. 39,414)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 22, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The appellant's statement of the grouping of the claims in the brief is correct.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

- Morley, G.D. et al, "Optimal Loading of SONET BLSRs", Canadian Conference on Broadband Research, Ottawa Canada, (June 1998)

- Wan, P.J., "Load Balancing in Counter-Rotated SONET Rings", International Conference on Parallel Processing, Japan, INSPEC Accession Number: 6397242 (1999), pp. 542-550

- US Patent No 6,014,567 Budka 01-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-3,7-10 and 12-23 rejected under 35 U.S.C. 102(b) as being anticipated by Morley et al. (CCBR, Optimal Loading of SONET BLSRs, June 1998).

2. In reference to claim 1, Morley teaches the method comprising the steps of:

determining a first circuit path between a source node and a destination node in a Synchronous Optical Network (SONET) ring comprising a plurality of nodes interconnected by links (pg 1 paragraph 2, pg 2 paragraph 1 lines 13-14 & paragraph 5 lines 1-3 and pg 5 paragraph 2 lines 3-4 & paragraph 3 lines 3-5, Morley discloses determining a path between two nodes on a SONET ring comprising a plurality of nodes interconnected by spans)

each of said links having associated with it a plurality of facilities, each of said facilities having associated with it a respective bandwidth utilization level (pg 2 paragraph 1 lines 13-14, pg 3 paragraph 1 lines 1-4 and pg 4 paragraph 4 lines 4-5, Morley discloses each span has a line capacity *c,* and each span can be a four fiber BLSR span. The four fibers (i.e. *facilities*) also have a capacity *c* because the fibers define the span),

said facilities having bandwidth utilization levels exceeding a first threshold level are not used to define said first circuit path (pg 1 paragraph 3, pg 2 paragraph 1 lines 13-14, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5, Morley discloses and if the total bandwidth demand on any span exceeds the threshold capacity *c* then that path and direction is not used, and another path in the opposite direction is subsequently used).

3. In reference to claim 2, Morley teaches the method of claim 1, further comprising the step of:

selecting a second circuit path in the opposing direction to said first circuit path where facilities having bandwidth utilization levels below a first threshold level in said first path can not be found for a Bi-directional Line Switched Ring (BLSR) (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5, Morley discloses not choosing a span if its load exceeds capacity c, in a SONET

BLSR network. The network has clockwise and counter-clockwise routing directions. If one direction is not chosen, then the other direction is selected as the routing path if it satisfies the load conditions).

4. In reference to claim 3, Morley teaches the method of claim 1, further comprising the step of:

Adjusting said threshold level where the bandwidth utilization levels of facilities in said second path exceed said first threshold level (pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3, Morley discloses capacity c as a variable which can be adjusted).

5. In reference to claim 7 Morley teaches a method comprising the steps of:

selecting a path between a source node and a destination node, said path comprising at least two intervening nodes coupled by at least one respective link, where said link has associated with it respective facilities; selecting one of said facilities within each of said at least one link for placing service on; and determining whether a respective bandwidth utilization level for each selected facility within said circuit path is below a first threshold (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 & paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5, and pg 4 paragraph 4 lines 4-5).

6. In reference to claim 8, Morley teaches the method of claim 7, further comprising the step of:

Altering the direction of said circuit path, responsive to a negative determination that within at least one link of said path no facilities exist having respective bandwidth utilization levels below said first threshold level for a Bi-directional Line Switch Ring (BLSR) (pg 1

paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

7. In reference to claims 9 and 10, Morley teaches the method of claim 8, further comprising the step of:

Adjusting said threshold level where the bandwidth utilization levels of facilities in said second path exceed said first threshold level (pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3).

8. In reference to claims 12, Morley teaches a method comprising the steps of:

a) selecting a path between a source node and a destination node, said path comprising at least one link; b) selecting a facility within each of said link connecting the source node to the destination node; c) determining the bandwidth utilization level for each facility within each link; d) rejecting said facility in the case of said respective bandwidth utilization level being above a threshold level; and e)repeating steps b) through d) until a circuit path is determined which meets said threshold level (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 & paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5, and pg 4 paragraph 4 lines 4-5).

9. In reference to claim 13, Morley teaches the method of claim 12, further comprising the step of: f) selecting a path in an opposing direction for a Bi-directional Line Switch Ring (BLSR) (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

10. In reference to claim 14, Morley teaches the method of claim 13, further comprising the step of: g) repeating steps b) through e) (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

11. In reference to claim 15, Morley teaches the method of claim 12, further comprising the step of: h) adjusting said threshold level incrementally (pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3).

12. In reference to claim 16, Morley teaches the method of claim 15, further comprising the step of: i) repeating steps a) through h) (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4, paragraph 3 lines 3-5, pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3).

13. In reference to claim 17 Morley teaches a computer readable medium storing a software program that causes a computer to perform a method comprising the steps of:

determining a first circuit path between a source node and a destination node in a Synchronous Optical Network (SONET) ring comprising a plurality of nodes interconnected by links, each of said links having associated with it a plurality of facilities, each of said facilities having associated with it a respective bandwidth utilization level, said facilities having bandwidth utilization levels exceeding a first threshold level are not used to define said first circuit path (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 & paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5, and pg 4 paragraph 4 lines 4-5).

14. In reference to claim 18, Morley teaches the method of claim 17, further comprising the step of:

selecting a second circuit path in the opposing direction to said first circuit path where facilities having bandwidth utilization levels below a first threshold level in said first path can not be found for a Bi-directional Line Switched Ring (BLSR) (pg 1 paragraphs 2-3, pg 2

paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

15. In reference to claim 19, Morley teaches the method of claim 17, further comprising the step of: Adjusting said threshold level where the bandwidth utilization levels of facilities in said second path exceed said first threshold level (pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3).

16. In reference to claim 20, Morley teaches the method of claim 19, further comprising the step of: repeating the step of determining (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

17. In reference to claim 21 Morley teaches an comprising:

An element manager, for determining a first circuit path between a source node and a destination node in a Synchronous Optical Network (SONET) ring comprising a plurality of nodes interconnected by links, each of said links having associated with it a plurality of facilities, each of said facilities having associated with it a respective bandwidth utilization level, said facilities having bandwidth utilization levels exceeding a first threshold level are not used to define said first circuit path (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 & paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5, and pg 4 paragraph 4 lines 4-5).

18. In reference to claim 22, Morley teaches the apparatus of claim 21, wherein:

In the case of no facilities within said links being below said utilization level, selecting a balanced path in the opposite direction to said first path direction for a Bi-directional Line Switched Ring (BLSR) (pg 1 paragraphs 2-3, pg 2 paragraph 1 lines 13-14 and paragraph 5 lines 1-3, and pg 3 paragraph 1 lines 1-4 and paragraph 3 lines 3-5).

19. In reference to claim 23, Morley teaches the apparatus of claim 21, wherein:

In the case no bandwidth utilization level of said facilities within said links being below said threshold level in said opposing direction to said first path, adjusting said threshold level (pg 4 paragraphs 1-3 and pg 5 paragraphs 2-3).

20. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morley et al. (CCBR, Optimal Loading of SONET BLSRs, June 1998) in view of Wan et al. (IEEE, Load Balancing in Counter Rotated SONET Rings, September 1999).

21. In reference to claim 4, Morley teaches the method of claim 2. Morley fails to explicitly teach wherein said first circuit path is a short path. Morley does teach routing demand in either a clockwise or counter-clockwise direction in a ring network (pg 1 paragraph 3, pg 2 paragraph 1 lines 13-14, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5). However, Wan teaches optimal load balancing transmissions in a SONET ring network between source and destination nodes (see Abstract). Wan discloses short-way routing where a circuit path is a short path (column 2 paragraph 1, column 14 paragraph 4 and figure 1).

It would have been obvious to one having ordinary skill in the art to combine Morley with Wan by specifying that the first path is a short path as per the teachings of Wan. One would be motivated to do so since short-way routing achieves optimal load balancing between source and destination nodes.

22. In reference to claim 5, Morley teaches the method of claim 2. Morley fails to explicitly teach wherein said second circuit path is a long path. Morley does teach routing demand in either a clockwise or counter-clockwise direction in a ring network (pg 1 paragraph 3, pg 2 paragraph 1

lines 13-14, and pg 3 paragraph 1 lines 1-4 & paragraph 3 lines 3-5). However, Wan teaches optimal load balancing transmissions in a SONET ring network between source and destination nodes (see Abstract). Wan discloses a routing path as a long path (column 2 paragraph 1, column 14 paragraph 4). Wan also illustrates that a request can be routed around a ring in a clockwise direction over a short path, or it can be routed around a ring in a counterclockwise direction over a long path (figure 1).

It would have been obvious to one having ordinary skill in the art to combine Morley with Wan by specifying the second circuit path as a long path as per the teachings of Wan. One would be motivated to do so since the opposite direction of a clockwise short path in a ring network is a counter-clockwise long path.

23. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morley et al. (CCBR, Optimal Loading of SONET BLSRs, June 1998) in view of Budka (U.S. Patent No. 6,014,567).

24. In reference to claim 6, Morley teaches the method of claim 3. Morley fails to explicitly teach wherein personnel are notified of a lack of facilities. However, Budka teaches detection and notification of load imbalances in a communication network (see Abstract). Budka discloses sending messages to terminals (which can be personnel terminals) indicating line congestions so that demand can be allocated to uncongested lines (see Abstract, column 3 lines 50-67 and column 4 lines 1-28).

It would have been obvious to one having ordinary skill in the art to modify Morley by sending notifications that will show that a line is congested and cannot support anymore load as

per the teachings of Budka. One would be motivated to do so, so that demand can be allocated to uncongested lines by the terminals whenever alerted by the notification.

25. In reference to claim 11, Morley teaches the method of claim 7. Morley fails to explicitly teach wherein personnel are notified of a lack of facilities. However, Budka teaches detection and notification of load imbalances in a communication network (see Abstract). Budka discloses sending messages to terminals (which can be personnel terminals) indicating line congestions so that demand can be allocated to uncongested lines (see Abstract, column 3 lines 50-67 and column 4 lines 1-28).

It would have been obvious to one having ordinary skill in the art to modify Morley by taking an action that will show that a line is congested and cannot support anymore load as per the teachings of Budka. One would be motivated to do so, so that demand can be allocated to uncongested lines by the terminals whenever alerted by the notification.

(11) Response to Argument

26. The examiner summarizes the various points raised by the appellant and addresses replies individually.

27. As per appellants arguments filed on November 22, 2004, the appellant argues that Morley fails *to teach, show or suggest at least determining a first circuit path between a source node and a destination node comprising links, each of the links comprising at least one facility, wherein facilities having a respective bandwidth utilization level above a first threshold level are not used to define the first circuit* (see pgs 15-16, argument A).

In reply, Morley does teach *a first circuit path between a source node and a destination node comprising links,* (Morley states that demand (signals) are routed "between a pair of nodes in either one or the other direction" (see pg 2, lines 13-14). Morley calls the *links* of the appellant as "spans" (see pg 2, section 2.1, line 2). It is seen that a span connects two nodes (which are inherently source and destination nodes)).

Morley does teach that *each of the links comprising at least one facility* (pg 2 paragraph 1 lines 13-14, pg 3 paragraph 1 lines 1-4 and pg 4 paragraph 4 lines 4-5, Morley states that each span can be a four fiber BLSR span. The four fibers (i.e. *facilities*) also have a capacity *c* because the fibers define the span),

Morley also teaches *wherein facilities having a respective bandwidth utilization level above a first threshold level are not used to define the first circuit,* (pg 1 paragraph 3, pg 2 paragraph 1 lines 13-14, Morley states "transport signals may be routed in either direction around the ring provided that the total load on any span does not exceed its line capacity c" (see pg 3, lines 2-3). This means that any span that has a total load (*bandwidth*) above a line capacity c (i.e. *threshold level*) is not used to define the transmission path.)

28. The appellant further argues that Morley fails to teach *the facilities comprising a respective link are assigned* ***a user defined threshold level*** *(bandwidth utilization threshold) of a total bandwidth of a link,* which is then ***checked against a preset threshold value and if the bandwidth utilization level of that facility exceeds the preset threshold, then the facility is not used to complete the selected path*** (see pg 17, argument A).

In reply, this argument is not persuasive because as explained in the Advisory action dated July 23, 2004, claim 1 (and any of the subsequent claims) fails to explicitly mention these features which the appellant bases the argument on. Particularly, ***"user defined threshold level"*** and ***"preset threshold"*** are not in the claim. The claim only mentions a *bandwidth utilization level* of a link.

29. The appellant further argues that because Morley does not anticipate appellants invention as recited in independent claim 1, then dependent claims 2,3,8-10,13-16,18-20 and 22-23 are also not anticipated by Morley (see pg 22 argument B, pg 23 argument C, pg 24 argument E, pg 26 argument G, pg 27 argument J and pg 28 argument L).

In reply, Morley does anticipate claim 1 as outlined above , and therefore dependent claims 2,3,8-10,13-16,18-20 and 22-23 are subsequently anticipated by Morley.

30. The appellant further argues that independent claims 7,12,17 and 21 recite limitations similar to those recited in independent claim 1, and are also not anticipated by Morley for the reasons stated in section A (see pg 24 argument D, pg 25 argument F, pg 26 argument H and pg 28 argument K).

In reply, Morley does anticipate claim 1 as outlined above , and therefore independent claims 7,12,17 and 21 are subsequently anticipated by Morley.

31. Appellant further argues that because Wan alone does not teach the invention of appellants claim 1, then Wan does not teach claims 2,4 and 5 (pgs 30-31, argument A).

In reply, Wan was never used as an independent reference to reject claims 1,2,4 and 5. Claims 1 and 2 were rejected under 35 U.S.C. 102(b) as being anticipated by Morley (see

paragraphs 2-3 above). Claims 4 and 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Morley in view of Wan (see paragraphs 6-7 above).

32. Appellant further argues that there is no suggestion or motivation to combine the teachings of Morley and Wan and that claims 4 and 5 are not rendered obvious by the teachings of Morley and Wan (see pgs 31-32, argument A).

In reply, appellant failed to explicitly explain why Wan fails to teach the deficiencies of Morley. Appellant merely states that Morley and Wan fail to teach claim 1. However, Morley does teach claim 1 as outlined above. Morley further teaches that in a ring network the demand is routed either clockwise or counter-clockwise over a span, depending on the span load not exceeding capacity c (see pg 3 lines 2-3 & lines 14-15).

Morley fails to explicitly teach where the first path is a short path and a second path is a long path. However, Wan teaches that it is inherent in a ring network for demand to be routed via a short path or a long path (see column 2 paragraph 1 and column 14 paragraph 4). Wan illustrates that the short path is routing in a clockwise direction and that the long path is routing in counter-clockwise direction (see figure 1). Therefore it would be obvious for one of ordinary skill in the art to make a combination of Morley and Wan where the clockwise routing of Morley is the short path of Wan and that the counter-clockwise routing of Morley is the long path of Wan, since these are inherent features of a ring network (i.e. demand can be routed either clockwise (in this case short path) or counter-clockwise (in this case long path).

33. Appellant further argues that the exact publication date of Wan is not properly cited although requested and Wan may not be a proper reference to cite as prior art (see pg 32, argument A).

In reply, Examiner clearly stated the publication date on page 7 paragraph 20 in the Final Office Action dated April 20, 2004. Examiner stated: "On document form PTO-892 examiner cited the publication date of Wan as 1999, which is before applicants filing date of 9/28/2000. Furthermore, as was included with the Wan reference, http://ieeexplore.ieee.org cites the Wan reference with Meeting Date: 9/21/1999 – 9/24/1999 and Publication Date: 1999."

34. Appellant further argues that because Budka alone does not teach the invention of appellants claim 1, then Budka does not teach claims 3,6,7,10 and 11 (pg 33, argument B).

In reply, Budka was never used as an independent reference to reject claims 3,6,7,10 and 11. Claims 3,7 and 10 were rejected under 35 U.S.C. 102(b) as being anticipated by Morley (see paragraphs 2 and 4 above). Claims 6 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Morley in view of Wan (see paragraph 9 above).

35. Appellant further argues that there is no suggestion or motivation to combine the teachings of Morley and Budka (see pgs 34-35, argument B).

In reply, Appellant fails to explicitly explain why Budka fails to teach the deficiencies of Morley. Appellant merely states that Morley and Budka fail to teach claims 1 and 7. However, Morley does teach claims 1 and 7 as outlined above. Morley further teaches when a load on a span exceeds its line capacity then that span is not chosen for routing (see pg 3 lines 3-4). This means that the span is congested and will not be used.

Morley fails to explicitly teach wherein personnel are notified of lack of facilities (i.e. transmission lines/spans). However, Budka teaches sending messages to terminals (which can be personnel terminals) indicating line congestions so that demand can be allocated to uncongested lines (see Abstract, column 3 lines 50-67 and column 4 lines 1-28). It would have been obvious

for one of ordinary skill in the art to modify Morley by sending notification indicating congested lines to personnel terminals as per the teachings of Budka. One would be motivated to do so, so that demand can be allocated to uncongested lines by the terminals whenever alerted by the notification.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

RMO
March 3, 2005

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